AD-A178 143 PROPOSED REVISION FOR MARINE CORPS REQUIRED OPERATIONAL 1/1
CAPABILITY (ROC) CC NUMBER 2564 FOR A TACTICAL
COMMUNICATION CENTER(U) MARINE CORPS WASHINGTON DC
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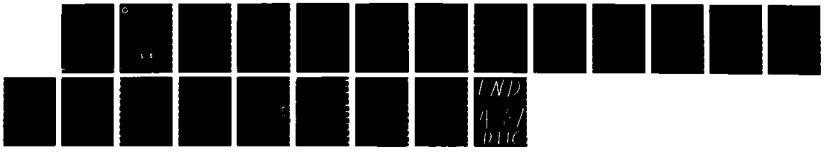

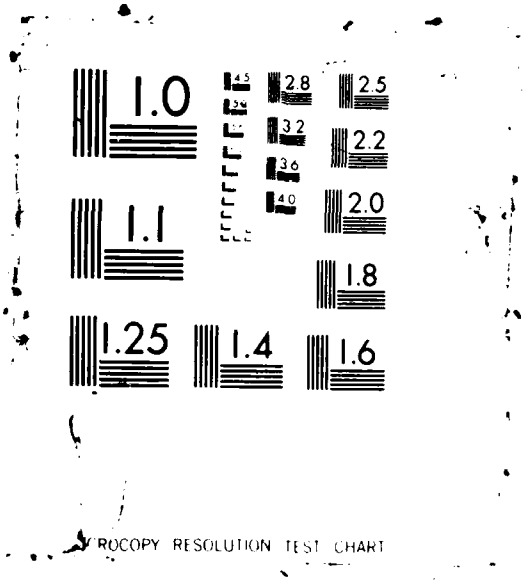
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DEPARTMENT OF THE NAVY
HEADQUARTERS UNITED STATES MARINE CORPS
WASHINGTON, D.C. 20380-0001

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17 DEC 1986

From: Commandant of the Marine Corps

Subj: PROPOSED REVISION FOR MARINE CORPS REQUIRED OPERATIONAL CAPABILITY (ROC) CC NO. 256.4 FOR A TACTICAL COMMUNICATION CENTER

Ref: (a) MCO 3900.4C

Encl: (1) ROC No. 256.4

1. In accordance with the procedures set forth in the reference, ROC No. 256.4 for the Tactical Communication Center is hereby established and promulgated.

2. The Commanding General Marine Corps Development and Education Command (Director, Development Center), Quantico, Virginia 22134-5001 is the Marine Corps point of contact for any questions pertaining to this ROC and any development efforts pertaining thereto.

F. X. Chambers, Jr.

F X. CHAMBERS, JR.
Colonel U. S. Marine Corps
Acting Deputy Chief of Staff for RD&S

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REVISED REQUIRED OPERATIONAL CAPABILITY (ROC CC NO. 256.4) FOR A TACTICAL COMMUNICATION CENTER

1. STATEMENT OF THE REQUIREMENT

a. A tactical communication center (TCC) capability is required to process record message traffic at those command echelons receiving, transmitting, or relaying high numbers of messages on a daily basis. The division, wing, force service support group (FSSG), and MAB/MAF headquarters require this capability. Message processing consists of receiving, storing, routing, transmitting, formatting, error-checking, reproducing, and distributing messages.

b. The TCC will consist of two shelters. One will contain communication center equipment for transmitting and receiving traffic and the second will contain the reproduction/distribution facility (RDF). The shelters will interconnect.

c. The initial operational capability (IOC) is required by FY90.

2. THREAT AND OPERATIONAL DEFICIENCY

a. Threat. The Marine Corps Long-Range Plan (MLRP) of May 1982 and the Marine Corps Mid-Range Objectives Plan (MMROP) of 8 Nov 1984 discuss present and projected threats confronting United States forces in the execution of combat operations.

b. Operational Deficiency. The current tactical communication center equipment, the AN/TGC-37 and AN/TYC-5A, utilize obsolete electromechanical teletypewriter equipment and other peripherals that are slow, unreliable, and increasingly difficult to maintain. This equipment is too heavy for amphibious operations and subsequent movement ashore. It will not interface effectively with future digital switching and transmission systems and cannot satisfy existing and projected traffic volume requirements with an acceptable writer-to-reader time. The capability to reproduce, collate, staple, and distribute copies of received messages in a tactical environment does not exist. The capability to store messages for subsequent retransmission or transfer to another communication circuit depends upon paper tape equipment which is exceedingly slow and cumbersome to operate. Additionally, this equipment is being gradually lost through attrition and lack of replacement parts. The ability of the FMF field commander to communicate with higher, adjacent, and subordinate commands with operational, administrative, intelligence and logistics messages is in jeopardy.

3. OPERATIONAL AND ORGANIZATIONAL CONCEPTS

a. A TCC will be employed at the MAB/MAF headquarters element and the division, wing and FSSG command posts (CP's) or alternate CP's. It will also interface with record traffic equipment and associated radios used in mobile tactical CP's. As shown in Annex A, the TCC would terminate several circuits to other major headquarters, the Defense Communication System (DCS), other services, and subordinate units. In addition, a number of internal CP circuits would be terminated to provide selected, high-priority staff users with immediate access to the record traffic system. The majority of messages would be composed/transmitted or received by staff agencies utilizing AN/UGC-74 teletypes, end-user computers (EUC) or automatic data processing equipment (ADPE) which is electrically connected to the TCC. The TCC will be responsible for accepting, formatting, routing, and transmitting messages as well as providing paper copies of all transmitted and received messages to the appropriate staff agencies. Service messages will be handled by communication center personnel within the TCC. The TCC is also responsible for relaying messages to other commands for which it holds the communications guard. Finally, the TCC must retain copies of all messages processed until it is unlikely that the messages will require servicing or retransmission; a minimum of 30 days is required. As discussed above, the basic goals of the TCC are to reduce writer-to-reader time and errors caused by excessive manual processing of messages and to provide the end-user with convenient, uniform access to the record traffic communication system.

b. The TCC will be required by both active and reserve forces, as well as the Marine Corps training and software support establishments and the Maritime Prepositioned Ships (MPS) MAB headquarters. A quantity of 31 systems is required.

c. The TCC automatic data processor will be operated by the present Marine communication center operators, MOS 2542/2549. Message reproduction equipment within the RDF will be maintained by office machine repair personnel, MOS 1182, at the FSSG and by teletype technicians, MOS 2818 at the using unit. All other equipment within the AN/MSC-63A will be maintained by Marines of MOS 2827, TCC automatic data processor system technicians. The equipment shall be designed to accommodate two operators inside each shelter. Technicians will not be required to set up or operate the TCC.

d. The TCC's using unit will require a nondedicated prime-mover for each of the TCC's two shelters, at least one environmental control unit (ECU) for each shelter, and at least 40kW of 60Hz power. Electronic maintenance facilities, radios and cabling, and terminal devices used by connected staff agencies are not part of the TCC and would be provided by the host organization.

4. ESSENTIAL CHARACTERISTICS. The TCC will utilize existing and planned tactical equipment to the maximum extent possible, consistent with the essential characteristics discussed below and the required IOC of FY90. Where military equipment is not available, commercial off-the-shelf items should be adopted for use in a shelterized environment. The TCC will consist of shelterized assemblages of equipment which may be easily reconfigured or upgraded by replacing or adding terminal equipment and by changing its control programs. The essential characteristics listed below are mandatory unless otherwise described as desired. All desired performance capabilities of the TCC need not be implemented in the initially fielded system, but the basic design will support ultimate attainment of desired capabilities by using modular hardware and software components. The hardware items (such as teletypes, mass storage unit, printers, processor, and visual display units (VDU's)) will use military interface standards to allow a variety of equipment to be easily interfaced or added to the initial TCC. Computer throughput capacity, memory size, and quantity of general purpose input/output (I/O) ports will be adequate to allow future upgrades to attain all desired characteristics listed below. System design shall comply with all Tactical Data Standards (TADSTANDS).

a. Mobility and Transportability. The TCC will be employed during amphibious landings and subsequent operations ashore. It must be transportable by air, sea, and land, using external load with rotary wing aircraft, internal load with fixed wing aircraft, and M923, 5-ton trucks. The size and weight of each shelter will be subject to the limitations of the 8' x 8' x 10' International Standardization Organization (ISO) shipping container, with a maximum weight of 7,500 pounds for the AN/MSC-63A and 5,000 pounds for the RDF in the fully equipped transport mode. System set-up and tear-down times will be 30 minutes desired for each, but no longer than one hour required for each defined as follows.

(1) Set-up time. Set-up will be accomplished by four operators. Set-up time starts upon arrival of the equipment at the site at which it is to be installed and ends when the TCC is operational. It includes the opening of combination cases, arrangement of equipment, unpacking and connection of cables, application of prime power, and the time required for initialization of the TCC, but not the installation of supporting communication links.

(2) Tear-down time. Tear-down will be accomplished by four operators. Tear-down time will be measured from the time the TCC stops sending and accepting traffic until it is prepared for removal from the area. It will include operator actions required to accomplish suspension of the TCC operations, power-down, disconnection of all cables, packing of cables, and closure of combination cases.

b. Power Requirements. The TCC must be operable from 3-phase, 120 volts line to neutral (208V line to line), 57-63 Hz power sources, both from tactical field generators and commercial sources (United States or overseas). Provisions will be made to ensure that unexpected loss of power, over-voltage conditions or out-of-range frequency conditions will not damage equipment or cause loss of operating programs or stored message traffic. Total TCC power requirements shall not exceed 40 kW and will be provided by the mobile electric power distribution system (MEPDS).

c. Communication Interfaces. The TCC Automatic Data Processor will be capable of terminating at least 20 serial circuits, each of which can operate in either a half-duplex or full-duplex mode, and be capable of adjustment between 75 and 2,400 bits per second (bps). These circuits will be used to connect operator terminals, selected peripheral equipment (local printers, teletypes, paper tape devices, and VDU's), external-CP encrypted communication circuits, or internal-CP circuits to a central processor/controller. At least two circuits will be capable of 1,200 and 2,400 bps, AUTODIN Mode I operation with either an AUTODIN switching center (ASC) or the AN/TYC-39 message switch. At least two additional circuits will be capable of operation with a digital secure voice terminal (DSVT) (KY-68) for access to a digital circuit switch (AN/TTC-39, AN/TTC-42, SB-3865) or a remote DSVT/single subscriber terminal (SST).

(1) COMSEC. All external circuits will be capable of using the dedicated loop encryption device (DLED) (KG-84A). The TCC will provide facilities for at least 8, preferably 10, KG-84A's and at least 2 DSVT's.

(2) Data Rates/Codes. At least 12 circuits will be capable of asynchronous operation. All will be capable of using International Telegraph Alphabet #5 (ITA-5), American Standard Code for Information Interchange (ASCII) character codes at selectable data rates of 75, 150, 300, 600, 1,200 and 2,400 bps. All asynchronous circuits will also be capable of using ITA-2 character codes at a data rate of 75 bps. The two circuits for AUTODIN and TYC-39 operation and the two circuits for DSVT operation shall be capable of synchronous operation.

(3) Modems. An adequate quantity of wire line and HF radio modems will be provided to ensure reliable communications over all external-CP circuits and intra-CP circuits. Modulation type and data rates will be compatible with the KG-84A and terminal devices used.

(4) Link Protocols. The TCC will support AUTODIN Mode I and Mode II protocols. A desired characteristic is support of TRI-TAC Mode VI.

(5) Other Terminal Systems. The TCC will provide for an automated communications link with the intelligence analysis

center (IAC) and the advanced tactical air command center (ATACC). It will provide for communications link(s) with the AN/TSC-96 in order to receive up to 4 fleet broadcast channels and to receive/transmit messages from/to the common user digital information exchange (CUDIX) network.

(6) Transmission Systems. The TCC will utilize the following transmission equipment for external-CP circuits:

(a) Wireline/Cable.

(b) Fiber-optic cable.

(c) AN/GRC-201.

(d) AN/TRC-97C.

(e) AN/TRC-170.

(f) AN/MRC-139.

(g) AN/TSC-85A/93A.

(h) AN/GRC-193,AN/PRC-104.

(i) Single channel objective tactical terminal (SCOTT) (MILSTAR Terminal).

(j) AN/TSC-96

(k) AN/TSC-95

(l) AN/TSC-() high frequency communications terminal (HFCT).

Internal-CP transmission will be over wire and/or fiber optic cable systems.

d. Message Processing. The TCC automatic data processor message processing will include buffering of received messages, error detection, format verification and translation, storage of all traffic to allow operator recall, routing of received messages to appropriate circuits or devices, traffic queuing for each transmit circuit or device, and automatic logging of all significant events. These actions may be initially accomplished on a semi-automatic (operator assisted) basis, with provisions made to fully automate these functions as resources permit.

(1) Received message buffering will allow messages to be completely received at data rates of 75 to 2,400 bps and then processed by the system.

(2) Error detection and error correction will provide for system detection and correction, if possible, of garbles (parity

errors), improper formats, misrouted messages, and potential or actual security violations.

(3) Format verification and translation will allow the TCC to properly receive, store, relay, and transmit messages in JANAP-128, ACP-127 (US Supp-1), ACP-127 (NATO Supp-3), ACP-126, or modified ACP-126 formats as appropriate.

(4) Storage of traffic will provide for on-line storage and recall of messages from a non-volatile mass storage unit. Messages must be accessible upon operator command when identified by their originator/date-time-group or OSRI/SSN/TOF (Originating Station Routing Indicator/Station Serial Number/Time of File). The storage capacity will be a minimum of three days of peak loading traffic normally experienced by a division, wing, FSSG, MAF, or MAB headquarters during a war-time situation. For TCC planning purposes, this load is assumed to be 1,000 messages per 24 hours with an average message length of 2,400 characters. In addition to the above, a desired capability is for storage of 30 days worth of message traffic in a non-volatile and removeable storage medium. This 30-day store will also allow access to messages by their originator/date-time-group or OSRI/SSN/TOF.

(5) Routing of messages will provide the ability to transmit or deliver a received message to the appropriate circuits or devices by using information about the message's routing field, classification, precedence, subject, originator, addressee(s), error status, language media format (LMF), and input device/circuit. Output devices and circuits will be class-marked in accordance with the highest level of classification authorized for transmission over those circuits. Provisions will be made for all classifications up to and including TOP SECRET SPECAT. Messages will not be transmitted over a circuit which has a lower classification than the message.

(6) Traffic queuing for transmit circuits and devices will allow multiple messages to be buffered in memory while awaiting transmission to these circuits/devices. In the event of a pending buffer overflow, the TCC will stop accepting new messages. In no case will a message which has been acknowledged for by the TCC be lost due to buffer overflow.

(7) Automatic logging of significant events will provide a hard-copy record of all message receptions, transmissions, rejections, and possible losses. Log entries will identify the message, circuit/device and action accomplished. Log entries will also be made to reflect system configuration changes or error conditions. Log entries will be adequate to completely identify a message and trace its progress through the system from its initial reception to its final transmission and storage.

(8) Processing delay and throughput of the system will be such that a flash or higher precedence message can be completely processed in less than one minute during the busy hour. All

other precedence messages will be processed in less than ten minutes during the busy hour. Processing time is exclusive of actual message transmission time. System throughput capacity will be 175 messages per busy hour, with an average message length of 2,400 characters.

e. Terminal Devices. The TCC automatic data processor will provide interfaces for USMC teletype equipment, paper tape reader/punch (PTR/P) equipment, EUC's, a non-volatile mass storage unit (MSU), and VDU's. The TCC will include a PTR/P, an MSU, and a sufficient number of teletypewriters or VDU's to accomplish message processing functions, system control, and system logging.

f. Message Reproduction. The RDF will include, in a separate shelter, at least two reproduction machines, one document shredder, and a receive-only printer. The combined capacity of the reproduction equipment will provide a minimum average rate of 20 copies per minute for sustained 24 hour/day operation, to include preventive and corrective maintenance downtime. Documents up to 8 1/2 by 11 inches in size must be reproduced on standard 20-pound bond paper. A collator (at least 10-bin, preferably 30-bin) will be provided. The shredder must support table-top operation and not exceed 2 cubic feet in dimensions or 100 pounds weight. The minimum throat width will be 8 5/8 inches with simultaneous input capacity of 5 sheets at a minimum speed of 40 feet/minute. The shredder will shred all normal communication center and administrative documents, microfilm, and microfiche to at least 1/32 inch x 7/16 inch and deposit it in a disposable shred container.

g. Environmental Considerations

(1) The TCC will be designed for fixed operation and transport on motor vehicles, trains, ships, and aircraft. Compliance will be required with applicable military standards for environmental tests such as vibration, shock, temperature, humidity, fungus, salt spray, sand, dust, acoustic noise levels, altitudes, and orientation. All components will be transported and operated within their respective shelters.

(2) Electromagnetic interference requirements will conform to MIL-STD-461B.

(3) TEMPEST requirements will conform to NACSIM 5100A.

(4) Each shelter shall be equipped with ducting configured for connection to standard Marine Corps stand-alone ECU's.

(5) The shelter must provide operator protection equivalent to individual chemical, biological, and radiological protective equipment, with the exception of gas masks.

(6) Nuclear survivability will conform to non-critical levels as specified in the TRI-TAC architecture.

(7) Grounding requirements shall be in accordance with MIL-E-16400.

(8) Human engineering considerations shall be in accordance with MIL-STD-1472.

h. Mission Essential Functions. The system must demonstrate the ability:

(1) To transmit and receive messages from AUTODIN and any two other agencies external to the CP.

(2) Of the TCC operator to enter and receive messages from the TCC.

(3) Of the TCC to store and retrieve all received messages.

(4) Of the TCC to maintain accountability for all messages received and transmitted.

(5) To meet the message delay and throughput capacity requirements of paragraph 4.d.(8).

i. Reliability, Availability and Maintainability

(1) RAM. Reliability is the probability that a system will operate without failure for a specified time under specified conditions. When maintenance actions are also considered, then system dependability and availability may be calculated. Dependability is the probability that the system can complete its mission for a specified time under specified conditions. Operational availability is the probability that a system is operating or ready to start operating at any given point in time, taking into consideration system downtime due to corrective maintenance, preventive maintenance, and administrative and logistics downtime. System transportation, set-up and tear-down times are not included. Design of the TCC will allow attainment of a dependability of 95 percent over a 30-day period of continuous operations ashore. An operational availability (A_o) will be 0.94. A system failure is defined as that condition in which the TCC cannot perform all of those essential functions of paragraph 4 of this ROC.

(2) Degraded Operation. TCC design will incorporate features which allow graceful degradation to semi-automatic or manual modes of operation in the event of equipment failure. This should be accomplished without appreciable increase in complexity or quantity of equipment. As the system degrades toward manual operation, the following functions shall be retained in priority order if possible:

(a) AUTODIN/DCS link.

(b) Other external-CP links.

(c) Manual teletype/paper tape capability.

(3) System Maintainability

(a) Organizational Level Maintainability. The minimum acceptable TCC organizational level median active corrective maintenance downtime ($MTTR_G$) shall not exceed 0.25 hours. The maximum active corrective maintenance time (M_{maxct}) at the 90th percentile shall not exceed 0.75 hours. Both terms are defined in MIL-STD-471. These times are to fault isolate and reconfigure the system with redundant equipment.

(b) Intermediate Level Maintainability. The minimum acceptable TCC intermediate level $MTTRG_G$ shall not exceed 0.5 hours. The M_{maxct} at the 90th percentile shall not exceed 1.5 hours. These times are to fault isolate, remove, replace and checkout either equipment, modules or assemblies as dictated by the maintenance philosophy.

5. INTER/INTRAOPERABILITY (I^2O) AND STANDARDIZATION REQUIREMENTS

a. I^2O. The TCC shall be capable of operations with DoD AUTODIN, U.S. Government, and allied communication centers worldwide. It shall be capable of interface to existing and planned inventory tactical record and data traffic communication systems in the operational forces.

b. The TCC shall be compatible with standard inventory tactical and commercial alternating current (AC) power sources only.

c. Other Warfare Areas Concerned. The introduction of the TCC will primarily affect Mission Area 256, Tactical Communications. The acquisition of this item is anticipated to have minimal effects on other warfare areas.

6. RELATED EFFORT. There is currently a Joint Operational Requirement for Modular Record Traffic Terminal Equipment (JCS-2510/860 of 19 Sep 1984) which partially describes the requirements defined in this ROC. The TRI-TAC SST program may fulfill some of the requirements of this ROC and the intent is to integrate the SST equipment into the TCC. The Marine Corps is also upgrading the AN/MSC-63 Special Security Communication Center (SSCC). The upgraded AN/MSC-63 can also partially fulfill the requirements of this ROC. USMC ROC LOG 1.27 for office-machine equipment addresses the requirements for the reproduction equipment which will be incorporated as part of the reproduction/distribution facility.

7. TECHNICAL FEASIBILITY AND ENERGY/ENVIRONMENTAL IMPACT

a. Technical Feasibility. The requirements of the ROC appear to be feasible within the current state of the art. The engineering development of the TCC facility and components will utilize, to the maximum extent possible, off-the-shelf items and state-of-the-art components to make the system operational. Currently there are communication terminals available. The software program experience gained from these terminals is definitely applicable. Therefore the hardware and software development required for the TCC is considered a moderate to low risk.

b. Energy-Effectiveness Impact. Total tactical power requirements should be reduced with the TCC by replacing the AN/TYC-5A and the AN/TGC-37V. There is no other apparent energy related impact associated with fielding the equipment described in the ROC.

8. LIFE CYCLE COST FORECAST. See Annex B.

9. MANPOWER REQUIREMENTS

a. The introduction of the TCC into the equipment inventory will directly affect military occupational specialties 2549, communication center chief, and 2542, communication center operator. Operation of the TCC is under the supervision of a communication center chief. The communications center operator, functions as the TCC operator.

(1) A three-man team will be adequate to man this system per 8-hour shift when deployed and operating in the field.

One Sgt-GySgt TCC Supervisor

Two Pvt-Cpl TCC Operators

(2) Twenty-five TCC systems in the active forces will require 75 supervisors and 150 operators for 100 percent manning. Six reserve force systems will require 18 supervisors and 36 operators.

b. Direct supporting MOS's will be 5977 and 2818 for intermediate and depot level maintenance of the TCC subsystems.

c. Indirect supporting MOS's for components will be:

(1) 2881-COMSEC equipment technician

(2) 1341-engineer equipment mechanic (Eng-Gen)

(3) 1142-electrical equipment repair specialist (Eng-Gen)

(4) 1161-refrigerator mechanic (ECU)

(5) OF35-motor transport (prime mover)

d. A compensatory reduction in manpower from existing tables of organization of the owning units will be identified prior to fielding the TCC.

10. TRAINING REQUIREMENTS

a. Formal Schools. The Marine Corps Communications Electronics Schools (MCCES) and the Communication Officer School (COS) will be required to develop TCC instructional packages for MOS's 2502, 2549, 2591, 2542, 2827, and 2818.

(1) MOS 2549/2542. The instructional package will contain learning objectives to develop skills in system installation, initialization, application and operation of the TCC and its components. Skills in the utilization of built-in-test (BIT) to troubleshoot and identify malfunctions of the system to determine an internal or external fault condition without technician assistance shall be emphasized. Interface of subscriber and terminals to the TCC, and operation and loading of COMSEC devices shall also be emphasized in the course curriculum. A 50 percent hands-on application training approach is desired.

(2) MOS 2502/2591. The instructional package shall be a condensed MOS 2549/2542 instructional package with an in-depth approach to TCC application. System planning, engineering, networking, and interfacing should be emphasized by the course curriculum.

(3) MOS 2827. The instructional package should contain a condensed MOS 2549/2542 instructional package with emphasis on the TCC subsystems architecture, and those skills required for intermediate level maintenance.

(4) MOS 2818. The instructional package should contain learning objectives on developing skills in the performance of intermediate level maintenance on the TCC terminal subsystem components for the reproduction distribution facility.

b. Factory. Instructor/key personnel currently holding MOS 2827 and MOS 2829 will be given factory training and will be used initially to maintain the TCC. MOS 2827 and 2829 will be combined into a single MOS 2827, TCC maintenance technician.

c. Field Skills. FMF schools and unit training packages should enhance formal operational schools skills and develop those skills needed within the unit to ensure effective and reliable employment of the TCC under expected operational scenarios.

d. Correspondence Courses. Basic and advanced level correspondence courses will require revision to include the TCC.

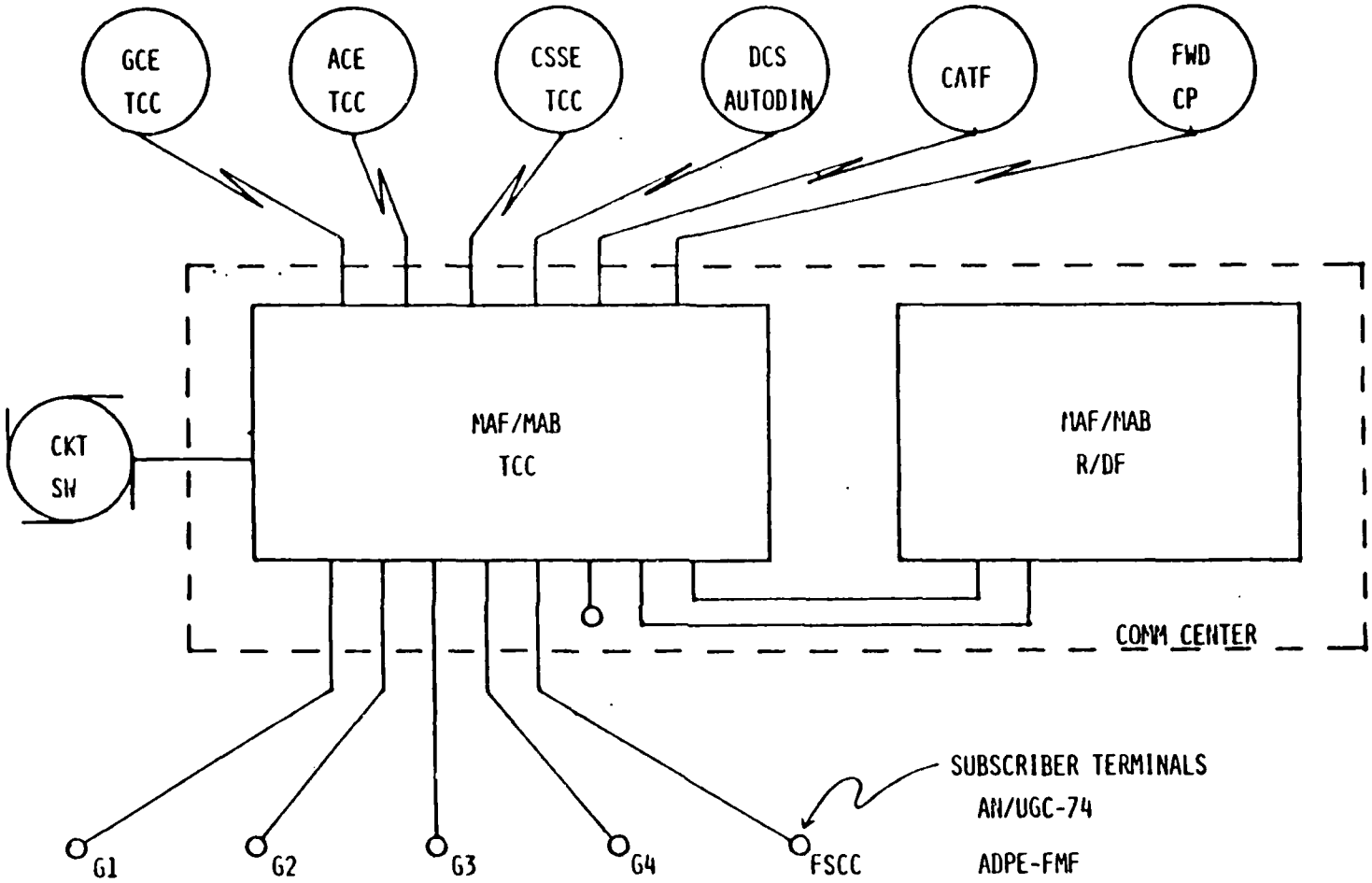
e. Training Support Requirements. Three TCC systems are required for MCCES maintenance and operator training.

11. Amphibious/Strategic Lift Impact. The TCC will have a favorable impact on tactical and strategic mobility by reducing weight and cube required by existing systems in the operational forces as shown below.

Comparison Of Mobility Effects

	wt (lbs)	cu ft.
Current		
AN/TGC-37 (V)	20,000	1,344
AN/TYC-5A	11,400	1,616
Proposed		
TCC (AN/MSC-63A)	7,500	640
RDF	5,000	640

The TCC will provide more than a fifty percent reduction in both weight and cube of the two individual systems it will replace.


GCE
TCC
ACE
TCC
CSSE
TCC
DCS
AUTODIN
CATF
FWD
CP
CKT
SW
MAF/MAB
TCC
MAF/MAB
R/DF
COMM CENTER
SUBSCRIBER TERMINALS
AN/UGC-74
ADPE-FMF
G1
G2
G3
G4
FSCC

TCC COE

System: AN/MSC-63A TACTICAL COMM CENTER

22 JUL 1986

LIFE CYCLE COST FORECAST

FUNDING PROFILE
In Thousands of FY87 Constant Budget Dollars
(FYDP Dollars in Parentheses)
(1 Oct 85 Escalators)

10 YEAR LIFE CYCLE

System	PRIOR YEARS	CURRENT YEAR	BUDGET YEAR	FY88	FY89	FY90	FY91	FY92	TO COMPL'N	TOTAL PROGRAM
E	4,478	3,235	5,004	3,949	3,744	2,722	2,089	1,877	0	27,099
YDF Dollars		(3,109)(	5,004)(	4,100)(	4,025)(	3,025)(	2,400)(	2,230)		
	0	0	0	9,260	10,697	11,472	1,856	556	0	33,841
YDF Dollars		(0)(	0)(	9,705)(	11,666)(	13,086)(	2,211)(	692)		
FUNDED	0	0	0	0	10	10	11	0	0	31
rt										
rt PMC	0	0	0	209	394	517	689	684	-0	2,494
YDF Dollars		(0)(	0)(	219)(	430)(	590)(	821)(	851)		
DN	0	0	0	0	0	0	0	0	0	0
YDF Dollars		(0)(	0)(	0)(	0)(	0)(	0)(	0)		
MC	0	0	0	0	1,098	2,117	2,050	3,820	6,351	15,435
YDF Dollars		(0)(	0)(	0)(	1,159)(	2,293)(	2,278)(	4,355)		
MCR	0	0	0	0	0	0	176	298	909	1,383
YDF Dollars		(0)(	0)(	0)(	0)(	0)(	200)(	350)		
C	0	0	0	0	0	1,434	3,006	3,938	7,022	15,400
YDF Dollars		(0)(	0)(	0)(	0)(	1,450)(	3,050)(	4,010)		
C	0	0	0	0	0	0	146	217	1,036	1,399
YDF Dollars		(0)(	0)(	0)(	0)(	0)(	150)(	225)		
Y PROC	0	0	0	0	0	0	0	0	0	0
L PROGRAM	4,478	3,235	5,004	13,436	15,932	18,262	10,012	11,390	15,319	97,070
YDF Dollars		(3,109)(	5,004)(	14,024)(	17,300)(	20,444)(	11,110)(	12,713)		

Major System. AN/MSC-63A TACTICAL COMM CENTER Date: 07-22-1986

LIFE CYCLE COST ESTIMATE
(In Thousands of FY87 Constant Budget Dollars)
(1 Oct 85 Escalators)

10 YEAR LIFE CYCLE

PHASE/CATEGORY		SUBCATEGORY	CATEGORY	PHASE
I.	RDT&E PHASE			27,099
II.	INVESTMENT PHASE			33,930
	1. SYSTEM PRODUCTION/PROCUREMENT		33,930	
	A. Major End Item (Contractor)	30,921		
	B. Initial Provisioning/Spares, Repair Parts	1,029		
	C. Government Furnished/Added Equipment	1,911		
	D. Other Direct System Costs	69		
	2. SUPPORT EQUIPMENT PROCUREMENT		0	
	A. Ammunition	0		
	B. Weapons and Tracked Combat Vehicles	0		
	C. Guided Missiles	0		
	D. Comm-Elec Equipment	0		
	E. Support Vehicles	0		
	F. Engineer and Other Equipment	0		
	3. MILITARY CONSTRUCTION		0	
III.	OPERATIONS AND SUPPORT PHASE			36,041
	1. OPERATIONS		6,234	
	A. Operator Personnel/Training	2,017		
	B. Material Consumption	321		
	C. Energy Consumption	3,895		
	2. MAINTENANCE		27,984	
	A. Organizational Maintenance	21,585		
	1) Personnel/Training	13,109		
	2) Maintenance Material	566		
	3) Repair Material	7,857		
	4) Other	54		
	B. Intermediate Maintenance	1,959		
	1) Personnel/Training	84		
	2) Maintenance Material	0		
	3) Repair Material	1,768		
	4) Other	107		
	C. Depot Repair	216		
	D. Depot Overhaul	0		
	E. Unprogrammed Losses	2,494		
	F. Software Maintenance	1,729		
	3. INDIRECT SUPT, BASE OPS & MAINT, OTHER O/H COSTS		1,824	
	A. Base Operations	461		
	B. Other Overhead Costs	1,363		
	4. SUPPORT EQUIPMENT O&S		0	
TAL LIFE CYCLE COSTS				97,070

O&S PHASE--Reserves				3,380
1. OPERATIONS			544	
A. Operator Personnel/Training		176		
B. Material Consumption		28		
C. Energy Consumption		340		
2. MAINTENANCE			2,674	
A. Organizational Maintenance		1,885		
1) Personnel/Training	1,145			
2) Maintenance Material	49			
3) Repair Material	686			
4) Other	5			
B. Intermediate Maintenance		171		
1) Personnel/Training	7			
2) Maintenance Material	0			
3) Repair Material	154			
4) Other	9			
C. Depot Repair		19		
D. Depot Overhaul		0		
E. Unprogrammed Losses		598		
F. Software Maintenance		0		
3. INDIRECT SUPT, BASE OPS & MAINT, OTHER O/H COSTS			162	
A. Base Operations		43		
B. Other Overhead Costs		119		
4. SUPPORT EQUIPMENT O&S			0	

END

4-87

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